

REMARKS

The claims have been amended to resolve issues raised by the Examiner. Also, claim 28 has been added depending on claim 16 and including recitations corresponding to claim 11 except for deleting carbon black, and claims 29 and 30 have been added depending on claim 16 and including recitations corresponding to claims 12 and 13, respectively.

Entry of the above amendment is respectfully requested.

Markush Language Issue

On page 2 of the Office Action, in paragraph 2, the Examiner indicates that the terminology "any of" in claims is improper Markush language, and apparently has made a rejection under 35 U.S.C. 112 on that basis.

On review, it appears that the Examiner is referring to the "any of" language in claims 21 and 22. Accordingly, Applicants have deleted "any of" from claims 21 and 22 to resolve this issue, and withdrawal of the rejection is respectfully requested.

Obviousness Rejection over Sung et al. or Landi et al.

On page 2 of the Office Action, in paragraph 4, claims 16-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sung et al. US 6,335,118 or Landi et al. US 6,586,533.

In response, Applicants note initially that Sung et al. states that it relates to a novel sulfurated hydrocarbon material having electrochemical activity, high capacity, and good reversibility, which can be used as an electrode material for the secondary battery. The sulfurated hydrocarbon (SHC) material contains from 40 to 88% of sulfur and is represented by the formula $(CH_xS_y)_z$, wherein: x is a real number in the range of $0.5 \leq x \leq 1.75$; y is a real number in the range of $0.2 \leq y \leq 3.2$; and z is an integer equal to or greater than 5 (see column 1, lines 14-

17, as well as the Summary of the Invention). The SHC material is prepared by sulfuration of an unsaturated olefinic hydrocarbon compound, in the presence of an amine promoter and comprises at least one or more structures of (a)-(d) (see column 4, lines 22-50). Sung et al. mentioned as an example of the polymeric unsaturated olefinic hydrocarbon compound 1,2-polybutadiene (see column 5, lines 38-42).

However, Sung et al. merely mentions as an example of the materials to be sulfurated 1,2-polybutadiene, and most importantly the double bond of 1,2-polybutadiene disappears as a result of sulfuration (see column 5, lines 21-32, and column 9, lines 21-36, Example VI). Thus, it is clear that the sulfurated hydrocarbon material described in Sung et al. does not contain a carbon-carbon double bond, whereas the hydrothermally resistant electroconductive cure product of the present invention contains a carbon-carbon double bond.

The sulfurated hydrocarbon material described in Sung et al. does not have a 1,2-butadiene "monomer unit having a side chain containing a carbon-carbon double bond" as defined in claim 16 of this application because a carbon-carbon double bond disappears as a result of sulfuration. Therefore, even if a carbonaceous material were incorporated into the sulfurated hydrocarbon material described in Sung et al., the resultant sulfurated hydrocarbon material could not become the same product as that defined in claim 16 of this application.

Thus, Applicants believe that the Examiner's viewpoint that the claimed invention is obvious from the descriptions of Sung et al. is inappropriate.

Turning now to Landi et al., Applicants note initially that Landi et al. relates to a thermosetting composition for use in electrical circuit laminate materials, wherein the composition is made of polybutadiene or polyisoprene. Landi et al. describes that the thermosetting composition may contain a dielectric filler since the composition is for use in

electric circuit laminate materials, and that examples of preferred fillers may include "silicon carbide" (see column 7, lines 31-43). As such, it is considered that the thermosetting composition described in Landi et al. is an insulation material.

The Examiner appears to believe that "silicon carbide" corresponds to a "carbonaceous material" as defined in claim 16 of this application. However, the "carbonaceous material" as defined in claim 16 as amended of this application is an electroconductive filler, whereas "silicon carbide" as described in Landi et al. is an insulation filler. That is, the thermosetting composition disclosed in Landi et al. is suitable for electrical circuit laminate materials and therefore is an essentially electric nonconductive resin composition. Thus, it is not intended in Landi et al. that an electroconductive filler is contained in the thermosetting composition. On the contrary, claim 16 as amended of this application expressly recites that the carbonaceous material is electroconductive.

For these reasons, Applicants believe that the Examiner's viewpoint that the claimed invention is obvious from the descriptions of Landi et al. is inappropriate.

Thus, Applicants submit that the present invention is not obvious over Sung et al. or Landi et al., and withdrawal of this rejection is respectfully requested.

Obviousness Rejection over Okamoto et al. or Simonot et al. or Nordsiek

On page 3 of the Office Action, in paragraph 7, claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. US 5,895,798 or Simonot et al. US 7,202,295 or Nordsiek 3,937,681.

In response, Applicants note initially that Okamoto et al. relates to a rubber composition containing a particular 1,2-polybutadiene resin as a reinforcing material (filler). Okamoto et al.

describes that the particulate 1,2-polybutadiene resin component is present in an amount of 1 to 50 parts by weight per 100 parts by weight of the liquid rubber component (see from column 2, line 67 to column 3, line 3).

In contrast, the hydrothermally resistant electroconductive cured product of claim 16 of this application has a Tg of 160°C, and thus is in the form of glass. This means that the physical property of the cured product of the present invention widely differs from that of the cured rubber article formed with the rubber composition described in Okamoto et al.

Turning now to Simonot et al., Applicants note initially that this reference describes a rubber composition usable for the manufacture of tires, based on at least one diene elastomer, a reinforcing inorganic filler and a coupling agent providing the bond between the inorganic filler and the elastomer, wherein the inorganic filler comprises a silicon carbide having the characteristics of a specific BET specific surface area and a specific average particle size (by mass) (see column 2, lines 52-63).

Simonot et al. also relates to a rubber composition, and thus differs from the hydrothermally resistant electroconductive cured product of claim 16 of this application which has a Tg of 160°C and thus is in the form of glass. In addition, as discussed above, the Examiner appears to believe that "silicon carbide" is electroconductive, but this is incorrect.

As to Nordsiek, Applicants note initially that this reference relates to a vulcanizable composition shaped into tire tread strip form, comprising a polybutadiene of a prescribed Mooney viscosity (a polybutadiene containing 25-50% of monomer units arranged in the 1,2-position; 10-40% of 1,4-cis-double bonds; 15-55% of 1,4-trans-double bonds) and a carbon black. As can be seen from the physical properties of the vulcanized product listed in Tables 1-3, the vulcanizable composition described in Nordsiek is also a rubber composition.

Applicants submit that the 1,2-polybutadiene used in the present invention has a saturated main chain and a plurality of side-chains having a carbon-carbon double bond. In the present invention, such a plurality of carbon-carbon double bonds are crosslinked and cured to form a three dimensional network structure which is a cured product showing no rubber-like elasticity.

As stated above, Okamoto et al., Simonot et al., and Nordsiek all relate to a rubber composition. Even if such a rubber composition is vulcanized, the resultant vulcanized product is still a rubber-like product, which widely differs from the hydrothermally resistant electroconductive cured product in the form of glass. Rubber is an elastic material which is deformable by an application of little force at a room temperature and goes back to the original shape by lifting the applied force, and has a Tg lower than a room temperature.

Since the hydrothermally resistant electroconductive cured product of claim 16 of this application has a Tg of 160°C, and Okamoto et al., Simonot et al., and Nordsiek all relate to a rubber composition, Applicants believe that the Examiner's viewpoint that the claimed invention is obvious from the descriptions of Okamoto et al. US 5,895,798 or Simonot et al. US 7,202,295 or Nordsiek US 3,937,681 is inappropriate.

Thus, Applicants submit that the present invention is not obvious over Okamoto et al., Simonot et al., or Nordsiek, and withdrawal of this rejection is respectfully requested.

Obviousness-Type Double Patenting Rejection

On page 4 of the Office Action, in paragraph 10, claims 19-22 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-17 of U.S. Patent No. 7,338,730.


In response, and to expedite allowance, Applicants submit herewith a terminal disclaimer to obviate this rejection. Accordingly, withdrawal of this rejection is respectfully requested.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

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